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A NOTE ON THE GENITALIA OF *POTAMOTHRIX HAMMONIENSIS* (OLIGOCHAETA: TUBIFICIDAE)

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Abstract.—*Potamothrix hammoniensis* (Michaelsen, 1901) is shown to possess a thickened internal penial basement membrane that is known elsewhere only in *Haber* Holmquist, 1978. This character is present in the syntype material of *P. hammoniensis* and in English and Italian specimens. A description of the syntypes of *P. hammoniensis* is given.

Examination of syntype material of *Potamothrix hammoniensis* (Michaelsen, 1901) has revealed that while an external thickened cuticular penis sheath is absent, an internal thickened penial basement membrane previously unreported is present. To date, this character is known elsewhere only from the genus *Haber* (Holmquist 1978, 1979). As *P. hammoniensis* is a very common European freshwater oligochaete, a complete description is desirable to ensure the stability of this taxon. Although this paper is not intended to be a formal redescription of *P. hammoniensis,* a complete description is given of the syntype material in order to supplement the original description. For a full synonymy of *P. hammoniensis* see Brinkhurst (1971).

Methods and Materials

Three syntypes of *Ilyodrilus hammoniensis* Michaelsen, 1901 were loaned to me courtesy of Dr. E. G. Easton, Annelida Section, British Museum (Natural History) (BMNH). Italian specimens of *P. hammoniensis* from L. DiGarda and L. d'Endine were collected by K. Coates and Dr. G. Bonomi; English specimens from Shropshire were collected by Ms. S. Cowley. The anterior part of one syntype was sectioned by the Laboratory of Analytical Systematics, Royal Ontario Museum, Toronto, Ontario. The second syntype, the posterior part of the sectioned specimen, and the Italian and English specimens were stained in paracarmine, acid-differentiated, dehydrated through an ethanol-xylene series and mounted in Canada balsam. The third syntype was retained in alcohol.

Systematic Description

Potamothrix hammoniensis (Michaelsen, 1901)
Figs. 1, 2

Ilyodrilus hammoniensis Michaelsen, 1901

Description (syntypes).—Length 12.4 mm and 15 mm, 75 and 71 segments respectively, width at clitellum (in unsectioned, slightly compressed, whole mounted specimen) 950 μm, 500 μm in sectioned specimen. Prostomium conical with rounded tip, about as long as broad at peristomium. Clitellum over XI–XII, absent ventrally in XI between male pores. Anterior dorsal setal bundles with 2–4 pectinate setae and 1–4 straight hair setae; pectinate setae with upper tooth longer and thinner than lower (2–3 small intermediate teeth often present), from

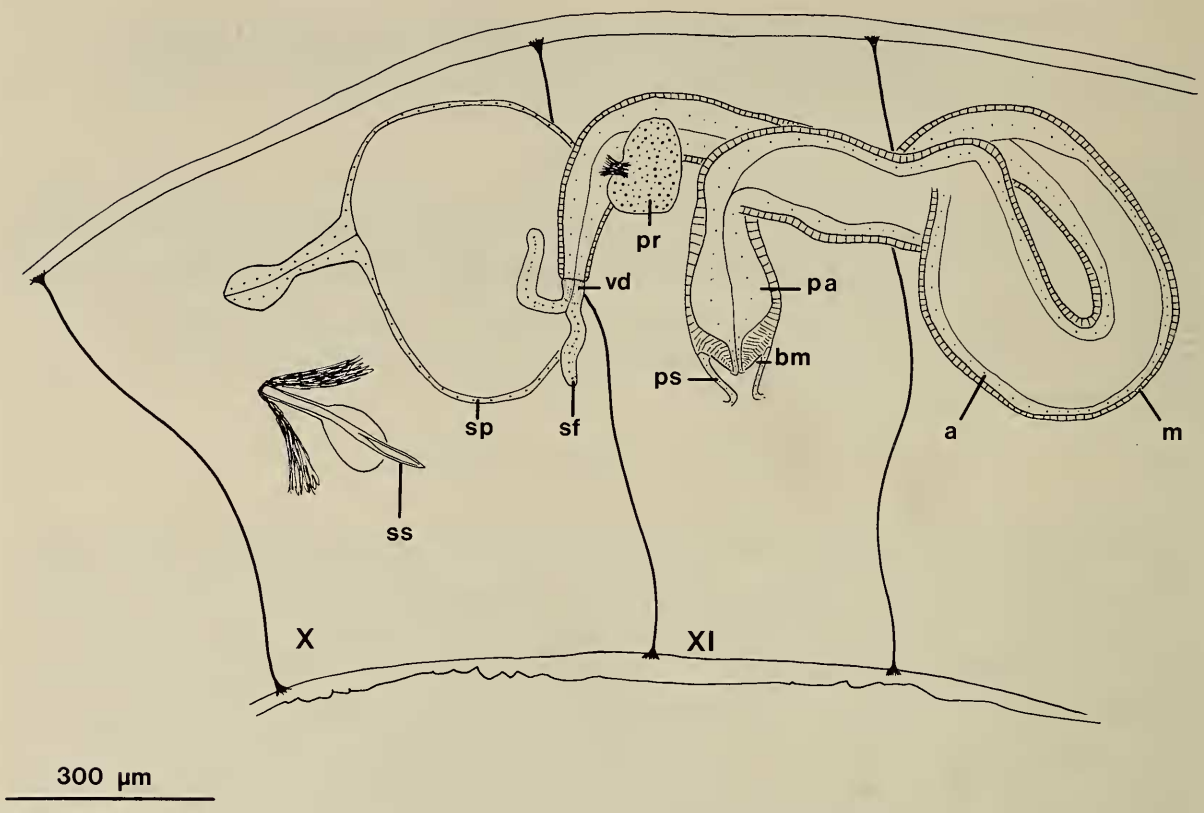

Fig. 1. *Potamothrix hammoniensis*, lateral view of genitalia in segments X and XI (drawn from syntype). a, atrium; bm, basement membrane; m, muscle layer; pa, penial apparatus; pr, prostate; ps, penial sac; sf, sperm funnel; sp, spermatheca; ss, spermathecal seta; vd, vas deferens.

125–140 µm long, 4–6 µm thick; hair setae from 330–400 µm long, approximately 2.5 µm thick. Posterior dorsal bundles with 1–2 bifid and 1–2 hair setae, bifid setae may have some small intermediate teeth; both bifid and hair setae decrease slightly in size posteriorly. Anterior ventral bundles with 3–5 bifid setae, posterior ventral bundles with 2–4 bifid setae; upper tooth longer and thinner than lower. Ventral setae of X modified as spermathecal setae (ss; Fig. 1, 2A); each bundle contains one large, thick (240 µm long; maximally 11 µm wide entally, 13.7 µm wide ectally) seta with distal hollow, gutter-shaped tip; tip of seta sharply pointed. Dorsal somatic setae of X present, ventral somatic setae of XI absent. Spermathecal and male pores median in X and XI respectively, spermathecal pores dorsolateral to spermathecal setae, in or slightly ventral to lateral line; male pores in ventral setal line. Chloragogen cells thick over gut in VI and VII, thinner posteriorly. Anus subterminal.

Male system (all structures paired) (Fig. 1, 2B): sperm funnel (sf) large, asymmetrical, ventral lip larger. Vas deferens (vd) short (approximately 30–40 µm long) and wide (23–26 µm), joining atrium apically. Atrium (a) 44 µm wide at junction of vas deferens, 98 µm wide at junction of prostate gland (pr), muscle layer (m) 6.5 µm thick in region of prostate gland junction; prostate gland joins atrium approximately 220 µm from sperm funnel. Atrium very long and tubular (1900 µm long to apical end of penial apparatus, 43–187 µm wide) with wide lumen; joining penial apparatus apically. The penial apparatus (Fig. 2B) consists of a muscular bulb the ectal part of which forms the main part of the penis; the penis is contained in a penial sac (ps) and lacks an external thickened cuticular

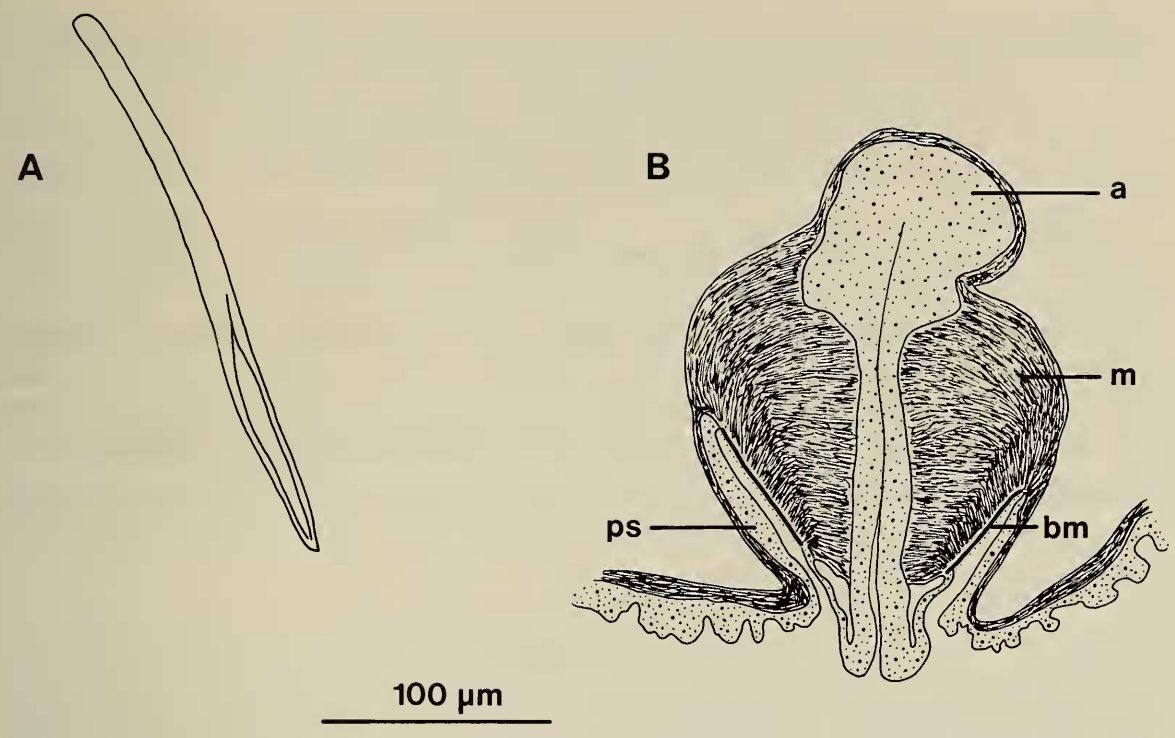

Fig. 2. *Potamothrix hammoniensis:* A, Spermathecal seta from syntype; B, Section of penial apparatus showing entrance of atrium (from L. d'Endine specimen), notation as in Fig. 1. Tissue over basement membrane represented by stippling.

sheath. Atrial tissue runs through the muscular bulb to join the very thin layer of epithelial tissue covering the penis; penial epithelial tissue continuous with penial sac epithelial tissue. Basement membrane (bm) of penial epithelial tissue thickened over protrusible part of penis except for the most ectal tip of penis.

Spermathecae (sp; Fig. 1) with distinct ducts and large saccular ampullae; ducts bulbous basally (55–60 µm wide) narrowing to 25–30 µm above bulbous bases, gradually widening to join ampullae, duct length 170–180 m. Thin muscle layer (2.5–3.0 µm thick) over ducts of spermathecae, muscle layer very thin or absent over ampullae. Sperm trap absent. Sperm as spermatozeugmata.

Remarks.—The degree of pectination of the dorsal setae tends to become reduced posteriorly so that some of the most posterior dorsal bundles contain bifid setae with no sign of pectination.

Material examined.—BMNH 1903. 4.28.10–14, 3 syntypes of *P. hammoniensis*; Baker collection: 20 whole-mounted specimens and 2 sectioned specimens from L. di Garda and L. d'Endine, Italy, 2 whole-mounted specimens from Shropshire, England; Cowley collection: 9 whole-mounted specimens from Shropshire, England.

Discussion

Potamothrix hammoniensis is the only member of *Potamothrix* that is known to possess a thickened penial basement membrane. This thickened membrane is known elsewhere only in *Haber* (Holmquist 1978, 1979). Although this feature appears to be rare within the Tubificidae, it is not suggested that *P. hammoniensis* is related to the members of *Haber* (recently expanded by Brinkhurst 1981). In

Potamothrix the vasa deferentia are very short and modified penial setae are absent (Brinkhurst 1971), whereas *Haber* has long vasa deferentia (composed of distinct thin and thick parts) and modified penial setae (Holmquist 1978).

The Italian and English specimens conform closely to the description of the syntypes. However, most of the specimens bear 1–2 normal ventral somatic setae in XI immediately posterior to the male pore. These setae are absent in the syntypes. The muscular bulb of the penial apparatus is usually also slightly larger than those of the syntypes. These differences are regarded here as being minor.

Michaelsen (1901:67) described the penis as "Penis weich, bei vallständiger Ausstreckung in der Mitte knopförmig angeschwollen, am freien Ende zapfenförmig." He apparently did not notice the thickened basement membrane of the penis. The thickening of the epithelial basement membrane in the penis may act as a penial stiffening device in much the same manner as an external cuticular penis sheath. This thickened basement membrane also provides an insertion point for the muscles of the penial bulb.

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